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van Wilgen, C.P.; Bloten, H.; Oeseburg, B.

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RESEARCH PAPER

Results of a multidisciplinary program for patients with fibromyalgia implemented in the primary care

C. PAUL VAN WILGEN[1,2], HENK BLOTEN[3] & BARTH OESEBURG[4]

[1]*Paincenter Department of Anaesthesiology, University Medical Center Groningen, University of Groningen,* [2]*School of Health Care Studies, Hanze University Groningen, University of Applied Sciences, Groningen,* [3]*Royal Dutch Physical Therapy Association, (KNGF), and* [4]*Northern Center for Healthcare Research, Department of Health Sciences, University Medical Center Groningen, University of Groningen, The Netherlands*

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Abstract

Purpose. Fibromyalgia is a syndrome of unknown origin with a high prevalence. Multimodal approaches seem to be the treatment of choice in fibromyalgia. A multidisciplinary program was developed and implemented for patients with fibromyalgia in the primary care setting. The program included education (seven sessions) and physical therapy (25 sessions).

Method. Patients were referred to the program by their general practitioner or by a medical specialist. A prospective non-controlled treatment study was performed, patients were evaluated before, after and three months after the program (single group time series design). The following measurements were performed: The Fibromyalgia Impact Questionnaire, RAND 36, the Pain Coping and Cognition List, the Tampa scale for kinesiophobia, two physical tests and a qualitative evaluation. Data of 65 patients with fibromyalgia were analysed, of whom 97% were female. The mean age was 44 and the mean duration of pain was nine years.

Results. Data of 65 patients with fibromyalgia were analysed, patients significantly improved on the domains feeling good, pain, fatigue, stiffness, quality of life, catastrophizing and on the physical tests.

Conclusion. The multidisciplinary program fibromyalgia implemented in primary care seems feasible and the results are promising.

Keywords: *Fibromyalgia, multidisciplinary program, primary care, non-controlled treatment study*

Introduction

The symptoms of the fibromyalgia syndrome have been described in 1990; it is a widespread pain syndrome in which at least 11 tender points must be present [1]. Until now no proper pathogenesis has been described, although it is argued that the pain may be explained by central sensitization and sensitization of deep tissues [2 – 4]. Furthermore, the pathogenesis seems to depend on multifactorially and individually different explanations which may consist of physical, psychological, behavioral, cognitive and environmental components [5,6]. Treatments are often multidisciplinary aiming on coping with fibromyalgia, they may include: Exercises or physical therapy [7 – 10], medication [6], cognitive-behavioral therapy [11,12] multidisciplinary rehabilitation [13], stress management, or education [7,14]. In a review, a multimodal approach consisting of exercises combined with education and psychologically based interventions, was described as the most promising treatment in the management of fibromyalgia [15]. Burckhardt [16] stated that the combination of self management (education with cognitive behavioral techniques) and exercises is the most effective in enhancing self-efficacy and decreasing symptoms.

Multimodal approaches however, are mainly offered in secondary or tertiary care [10], while most fibromyalgia patients in The Netherlands are treated

Correspondence: C. P. van Wilgen, Paincenter University Medical Center Groningen, University of Groningen, PO Box 30.001, 9700 RB Groningen, The Netherlands. Tel: +31 50361 4886. Fax: +31 50361 9317. E-mail: c.p.van.wilgen@anest.umcg.nl

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in the primary care in monodisciplinary approaches. Multimodal approaches are seldomly implemented in primary care and treatment in primary care is seldomly subjected to scientific studies; in the literature there is a need of such treatment studies. Therefore a multidisciplinary self management program in the primary care was developed including education and physical therapy. The aim of this article is to describe the implemented multidisciplinary self management program for patients with fibromyalgia in the primary care and to analyse the short term effects of the program.

Materials and methods

Program

The multidisciplinary program active living with fibromyalgia (MPF) (Figure 1) included an education program with seven sessions aiming at: Cognitive restructuring, information on fibromyalgia, goal setting, pacing, distraction, assertiveness training, relaxation and 25 physical therapy sessions aiming at exercises, relaxation and goal setting. The exercises were performed according to the operant conditioning principles using a graded activity program [17]. The trainers and physical therapists were involved in the development of the program and were trained before the MPF. The program included a workbook for trainers, guidelines for the physical therapists and a textbook for patients [18].

Study population

The multidisciplinary program active living with fibromyalgia (MPF) was implemented in the province of Drenthe in The Netherlands. General practitioners and rheumatologists were informed about the program and the possibility to refer patients, diagnosed with fibromyalgia, to an information meeting regarding the program. These meetings were led by a nurse specialist in rheumatology, at these information meetings, patients, often accompanied by their partners or spouse, were informed about fibromyalgia and the MPF. If patients wanted to participate in the MPF an individual appointment was made with the nurse specialist, to consider if the patient met the inclusion criteria (Figure 2). Included patients were clustered in a group of 8 – 12 patients for the educational part; this group was later divided into two separate groups for the physical therapy part. Seventy-three patients were included; eight patients did not complete the MPF; two patients for medical reasons (broken arm, shoulder operation), two patients for psychosocial reasons (depression, diseased relative), three were not able to do exercises and one patient stopped for unknown reasons.

Education	Week	Physical therapy program (PT)
What is fibromyalgia Personal targets education	1	
Communication	2	
Fibromyalgia and emotion	3	
Fibromyalgia and stress	4 PT session 1	Introduction, purpose of the program what is fibromyalgia, information about chronic pain, education about the importance of staying active, graded activity principles, personal targets after the program, information about the partner day
	5 PT session 2,3	Relaxation (Jacobsen, Mitchell) getting familiar with the training appliances, hand out personal training file to registration achievements
I, others and the environment	6,7 PT session 4,5,6	Relaxation Start exercises
How to say what I mean	8, 9 PT session 7,8,9	Exercises
How to proceed.....?	10 PT session 10	Exercises
	11–17 PT session 11–24	Exercises, two personal evaluation sessions, partner day
	30 PT session 25 (follow-up)	Evaluation

Figure 1. Multidisciplinary program active living with fibromyalgia*.
*More information of the program can be obtained from the first author.

Inclusion:
• Diagnoses of fibromyalgia by GP or rheumatologist. • The patient demands no further medical assessment, agrees with the purposes of the program, is mentally and physically able to follow the program and is motivated.
Exclusion:
• The patient has followed a similar program or is undergoing treatment somewhere else on the moment, cognitive disorders, psychopathology, acute psychosocial problems, insurance claims or medical re-assessment, pain as a consequence of malignancy, extreme fatigue, not able to understand or speak Dutch or to function in a group.

Figure 2. Inclusion and exclusion criteria of the MPF.

Measurements and method

A prospective non-controlled treatment study was performed. The efficacy of the MPF was evaluated before the program (T0), after the MPF (T1) and three months after the MPF (T2); a single group time series design. Before the program socio-demographic data were assessed: age, gender, work, marital status and duration of fibromyalgia. The following outcome measures were assessed.

The Fibromyalgia Impact Questionnaire (FIQ) is a self administrated questionnaire including 20 items including 4 subscales: Physical impairment (11 items), number of days feeling good (range 0 – 7), number of days unable to work (range 0 – 7), and symptoms; pain, fatigue, rested, stiffness, anxiety, and depression (score range 0 – 10). The items of the subscale physical functioning and feeling good were recoded to a score of 0 – 10. The number of days unable to work was not calculated as a minority of the patients was employed [19]. The Questionnaire has credible construct validity, reliable test-retest characteristics, and a good sensitivity for therapeutic changes [20].

Quality of life was measured using the RAND-36; this is the Dutch version of the SF-36 extended with the domain health changes [21]. It includes 36 items measuring nine health-related quality of life domains. Responses were calculated to percentages from 0% (poor health) to 100% (excellent health). The psychometric properties of the Dutch version of the RAND-36 were found to be adequate [21]. Patients with fibromyalgia were compared to a reference group, of the same age, from the RAND-36 manual. This reference group was a group selected from the general Dutch population.

The pain coping and cognition list (PCCL) is a self-administered Dutch questionnaire with 42 questions measuring four subscales: Catastrophizing, pain-coping, internal pain control and external pain control. Support was found for internal consistency and construct validity of the PCCL [22].

The Tampa scale for Kinesiophobia is a self-administered questionnaire assessing 17 items, regarding beliefs of the relationship between pain and activities and beliefs about injuries and re-injuries [23]. The total score and the recently described two factor model for patients with fibromyalgia (somatic focus and activity avoidance, including 13 items) were analysed. Several studies found support for the construct and predictive validity and reliability of the Tampa scale [24].

Two physical tests were assessed by the physical therapists. In the step test, patients step with one foot on a 20 cm high bench as long as possible changing from one to the other foot. The test ends when a patient decides to stop, the physical therapist decides that the quality of the movements is no longer acceptable or when a maximum of 300 steps is achieved. The vertical row is a test in which patients have to pull a weight backward with both arms while sitting. Patients may choose the amount of kilograms. From the weight and the number of times pulled a vertical row maximum was calculated. Both tests were developed for the program to evaluate physical performance. The validation or reliability of these tests in fibromyalgia patients is yet unknown.

At follow-up, a personal evaluation form was filled out by the patients. In this evaluation patients could rate the quality of the MPF with a number between 0 (bad) and 10 (excellent). Patients were asked which activities they had started through the MPF, and whether they still performed these activities three months after the program. Also at follow-up (T2), patients were asked to fill out a list of changes. In this list of 24 positive and negative statements, patients could mark up to 24 items they felt reflected a positive or negative change they experienced through the MPF. This list of items was developed for this study to explore, in a quantitative way, opinions of patients about the effects of the MPF.

Statistical analyses were performed in SPSS 10.0 by the first author who was not involved in the actual program. The mean scores before (T0), after (T1) and at follow-up (T2) were analysed with a one-way ANOVA multi-comparison within groups and with post-hoc analyses (Bonferroni), the p values < 0.05

and <0.01 are presented. The RAND-36 scores of patients with fibromyalgia before the MPF (T0) were compared with a reference group (age 35–44) by 95% Confidence Interval analyses of difference. Qualitative data were listed.

Results

Data of 65 patients were available for analysis; descriptive data are presented in Table I. Twenty-nine (45%) of the patients were employed, most patients were (also) housewives. Twenty patients (31%) received a (partial) disability pension, one patient was retired. The average duration of fibromyalgia was nine years (SD: 6.5).

Results of the FIQ are presented in Table II. Before the program the intensity of the perceived symptoms; pain, fatigue and stiffness was high. In the ANOVA within groups patients significantly improved on feeling good, pain, fatigue and stiffness. In the analyses pre- to post-treatment patients gained significant improvements in the domains feeling good, pain and stiffness. In the pre-treatment to follow up analyses patients significantly improved on the domains feeling good, pain, fatigue and stiffness. No changes were found in physical impairment, rested and in the psychological domains anxiety and depression.

Patients with fibromyalgia had a significantly lower score on all domains of the RAND-36 before treatment, compared to the reference group (Table III). Physical functioning, role limitations physically, vitality, pain and health changes improved significantly. In six domains of the RAND-36 significant improvements were measured in the course of pre-treatment to follow up analyses (Table IV).

On the PCCL catastrophizing improved significantly during the MPF both in the pre- to post-treatment analyses and in the pre-treatment to follow-up analyses. On the domains pain coping, internal pain control and external pain control no changes were measured (Table V). On the Tampa

Table I. Descriptive data of the study group.

Total	65 patients
Gender	
Female	63 (97%)
Male	2 (3%)
Age (SD)	44 (11)
Duration of pain years (SD)	9 (6.5)
Social status:	
married/cohabiting	54
divorced	4
widow	1
single	6

Table II. Results of ANOVA of the Fibromyalgia Impact Questionnaire on T0 (pre-treatment), T1 (post-treatment) and T2 (follow-up) and p values for post hoc (Bonferroni) corrected analyses; T0–T1 and T0–T2.

	T0	T1	T2	p ANOVA
Physical impairment	6.0 (1.7)	6.7 (2.0)	6.7 (1.7)	0.22
Feel good	3.7 (2.6)	5.1 (2.7)**	5.4 (2.4)$^{\#\#}$	<0.01
Pain	7.3 (1.7)	6.4 (2.1)*	5.9 (2.1)$^{\#\#}$	<0.01
Fatigue	8.0 (2.0)	7.1 (2.2)	6.6 (2.3)$^{\#\#}$	<0.01
Rested	7.5 (2.1)	6.8 (2.5)	6.8 (2.4)	0.14
Stiffness	7.5 (1.8)	6.3 (2.5)*	6.4 (2.5)$^{\#}$	<0.01
Anxiety	4.8 (2.9)	4.1 (2.9)	3.8 (2.8)	0.13
Depression	4.0 (2.9)	3.3 (2.5)	3.5 (2.5)	0.32

Bonferroni T0–T1: *$p < 0.05$ and **$p < 0.01$; T0–T2: $^{\#}p < 0.05$ and $^{\#\#}p < 0.01$.

Table III. 95% Confidence Interval of the difference between patients with fibromyalgia before treatment (T0) compared with a reference group from the general population.

	Before treatment Mean (SD)	Reference group age 35–44	95% CI of the difference (reference group and T0)
Physical functioning	50 (18)	90 (14)	35.7–44.3
Social functioning	60 (19)	88 (18)	22.9–33.2
Role limitations physically	13 (23)	83 (32)	61.5–78.5
Role limitations emotionally	59 (45)	82 (34)	12.6–33.5
Mental health	67 (19)	77 (18)	4.9–15.2
Vitality	41 (15)	67 (19)	20.9–31.1
Pain	40 (15)	84 (22)	38.2–49.8
Health perception	54 (20)	74 (21)	14.2–25.9
Health changes	37 (26)	55 (18)	12.3–23.7

Table IV. Results of ANOVA of the RAND-36 on T0 (pre-treatment), T1 (post-treatment) and T2 (follow-up) and p values for post hoc (Bonferroni) corrected analyses; T0–T1 and T0–T2.

	T0 Mean (SD)	T1 Mean (SD)	T2 Mean (SD)	p ANOVA
Physical functioning	50 (18)	61 (19)**	59 (22)	<0.01
Social functioning	60 (19)	66 (21)	69 (23)	0.07
Role limitations physically	13 (23)	26 (34)	34 (39)$^{\#\#}$	<0.01
Role limitations emotionally	59 (45)	67(43)	80 (34)$^{\#}$	0.03
Mental health	67 (19)	71 (17)	75 (14)$^{\#}$	0.03
Vitality	41 (15)	49 (18)*	53 (15)$^{\#\#}$	<0.01
Pain	40 (15)	48 (17)*	53 (16)$^{\#\#}$	<0.01
Health perception	54 (20)	56 (20)	60 (19)	0.25
Health changes	37 (26)	52 (33)*	58 (31)$^{\#\#}$	<0.01

Bonferroni T0–T1: *$p < 0.05$ and **$p < 0.01$; T0–T2: $^{\#}p < 0.05$ and $^{\#\#}p < 0.01$.

Table V. Results of ANOVA on the Pain Coping and Cognition Scale and the Tampa Scale for Kinesiophobia on T0 (pre-treatment), T1 (post-treatment) and T2 (follow-up) and p values for post hoc (Bonferroni) corrected analyses; T0 – T1 and T0 – T2.

	T0	T1	T2	p ANOVA
Catastrophizing (SD)	3.0 (0.8)	2.6 (0.8)*	2.5 (0.8)##	<0.01
Pain coping (SD)	3.4 (1.0)	3.4 (1.0)	3.4 (1.0)	0.96
Internal pain control (SD)	4.0 (0.8)	3.9 (0.9)	4.0 (1.0)	0.92
External pain control (SD)	2.1 (0.8)	2.0 (0.8)	2.1 (0.7)	0.90
Kinesiophobia (SD)	32 (7)	31 (8)	31 (8)	0.68
• Somatic focus (SD)	8.9 (2.4)	8.8 (2.7)	8.6 (2.7)	0.77
• Activity avoidance (SD)	15.9 (4.3)	15.1 (4.3)	15.0 (4.5)	0.43

Bonferroni T0 – T1: *$p < 0.05$ and **$p < 0.01$; T0 – T2: #$p < 0.05$ and ##$p < 0.01$; Norm scores from the PCCL manual: very low: 1 – 1.9, low: 2 – 3.4, high: 3.5 – 5 and very high: 5.1 – 6 [22].

scale patients with fibromyalgia had a mean score of 32 subsequently; no changes were measured on the Tampa scale. The domains somatic focus and activity avoidance were low and did not change during the treatment or during follow-up (Table V).

The step test and vertical row both improved, although not significantly for the vertical row (Table VI). Patients' mean (range) rating of the MPF was 8 (min: 6 – max: 10). Three months after the MPF one patient stopped the activities; all other patients did some form of physical activity (tai chi, swimming, cycling, walking, fitness) as a consequence of the MPF.

Patients listed six items on average in the list of changes, 16 of the 24 most chosen statements are presented in Table VII. The number of positive items exceeds the negative ones. Besides 'feeling more fit' (55%), 'coping better with pain' (48%), 'think more positive' (45%) and 'being less frightened of moving' (42%) were most indicated by the patients. Negative statements were also reported; 'more fatigue' (12%) and 'more pain' (11%).

Table VI. Results of ANOVA of the physical tests on T0 (pre-treatment), T1 (post-treatment) and T2 (follow-up) and p values for post hoc (Bonferroni) corrected analyses; T0 – T1 and T0 – T2.

	T0	T1	T2	p ANOVA
Step test mean (SD)	100 (69)	148 (92)**	152 (101)**	<0.01
Vertical row mean (SD)	121 (332)	161 (465)	222 (557)	0.49

**$p < 0.01$; The step test: mean number of steps is presented, the vertical row calculated maximum (frequency × kilograms) is presented.

Discussion

The MPF seems to be a feasible and effective form of primary care for patients with fibromyalgia. Patients significantly improved on the domains feeling good, pain, fatigue, stiffness, quality of life, catastrophizing and on the physical tests. Most improvements were measured over the pre-treatment to follow-up period. No changes were found in the emotional domains such as anxiety, depression, socials mental health and role limitations emotionally. In the evaluation patients rated the quality of the MPF with 8 out of 10.

The FIQ showed improvements in the pre to post treatment analyses, these effects increased during follow-up, which might indicate that patients continued with their changed behavior. Low depression and anxiety scores were found, these outcomes are in accordance with Swedish and American populations using the FIQ [25]. The outcomes of depression and anxiety were measured at a group level. From other studies it is known that in sub-groups of patients with fibromyalgia depression and anxiety levels can be high [26].

Compared to the reference group initial scores on health-related quality of life were significantly lower for all domains. This is in agreement with the literature of patients with fibromyalgia [27]. Teaching patients to manage their fibromyalgia was the main goal of the program; since results in eight of the nine domains improved during follow-up most of the patients seem to have achieved this goal. The results as a whole indicate that patients, through the MPF, gained a better quality of life. But although several domains increased significantly, they remained lower than those of the reference group. On the PCCL only catastrophizing decreased significantly, both in the pre-treatment to post-treatment analyses as well as at follow-up. Catastrophizing is a critically important variable, which is related positively to the severity of pain, affective distress, muscle and joint tenderness, disability and poor treatment outcome [28]. Therefore improvements in catastrophizing seem to be one of the key factors in improving other domains.

Just as described in the study of Roelofs et al. (2004) fibromyalgia patients in this study show low scores on the Tampa scale for kinesiophobia

Table VII. List of 16, out of 24, most marked changes ($n = 65$) three months after the program.

Physical fitness improved	36 (55%)	Less fatigued	13 (20%)
Can better cope with my pain	31 (48%)	More social contacts	10 (15%)
Thinking more positive	29 (45%)	Nothing has changed in daily life	10 (15%)
Less frightened of exercising	27 (42%)	Less morning stiffness	9 (14%)
Increased daily activities	20 (31%)	Sleep improved	9 (14%)
More cheerful	18 (28%)	Fatigued improved	8 (12%)
Less pain	13 (20%)	More pain	7 (11%)
More pleasure in life	13 (20%)	Less use of analgesics	7 (11%)

compared to patients with low back pain [24]. Burwinkle et al. [29] described that fibromyalgia patients seem to avoid exercising because they fear pain following physical activities. In our study, the domains somatic focus and activity avoidance were also analysed. Activity avoidance reflects the belief that activity may result in (re)injury or increased pain; somatic focus reflects a belief in underlying and serious medical problems. The unchanged activity avoidance score seems to contradict the improvement of the physical tests. Presumably the fear avoidance model cannot explain the different coping styles of patients with fibromyalgia; some patients seem to fear pain, and avoid activities, while other patients seem to ignore pain, exercise in excess and are not afraid of (re)injury. Vlaeyen and Morley (2004) introduced the use of stop rules and mood interpreting behavior in patients with fibromyalgia. Although their model needs further development it seems useful in understanding the diversity in coping styles in fibromyalgia patients [30]. The positive results of the physical tests in our study seem promising but interpretation is difficult. Do they reflect better physical condition, reduced fear of movement, actual pain reduction, or less anticipation to pain? Observation of behavior during testing seems therefore to be just as valuable as the numerical outcome of the test. Quantifying behavior during the observation of physical tests is to be a subject of future studies and will be implemented in the future test protocol of the MPF. The list of changes is a more quantitative way of measuring beliefs of patients about the way the MPF affected them. The list seems to reflect a more personal reaction of patients; the reliability however is still unknown. Further research on the validity of this list of changes is required. In an evaluation session the trainers and physical therapists were satisfied with the MPF, the interaction induced by the education part and physical therapy part was judged as complementary.

The weakness of the study was that no control group was included. Implementing a multidisciplinary program in the primary care for fibromyalgia patients seems cost effective and important for secondary prevention [31,32], but in this study a cost-effectiveness study was not performed. Patients were not randomly chosen but selected as a consequence of the information given before the program. Probably the ingredients of this information induce that severe inactive or catastrophizing patients might choose not to take part in the MPF. Effects described in this study can therefore not be generalized to the total group of fibromyalgia patients. The inclusion criteria were clear but applying some of the inclusion/exclusion criteria might be difficult, such as in the case of: Mentally and physically able to participate in the program, cognitive disorders, and psychopathology. More experience with the MPF will give more insight in using these criteria. The strength of the study was that measurements were on a multidimensional level including symptoms, psychological effects, quality of life, disability and physical performance. Furthermore this study is one of the first evaluating a primary care program. Most programs described in literature are developed for experimental settings or in the secondary or tertiary care settings. These programs can not be expected to have the same effects in the primary care, therefore, careful implementing processes and evaluation of primary care programs are important to accomplish a qualitatively good primary care program. Although the program needs further evaluation and improvement the preliminary results seem promising.

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References

1. Wolfe F, Smythe HA, Yunus MB, Bennett RM, Bombardier C, Goldenberg DL, et al. The American College of Rheumatology 1990. Criteria for the Classification of Fibromyalgia. Report of the Multicenter Criteria Committee. Arthritis Rheum 1990;33:160 – 172.
2. Woolf CJ, Mannion RJ. Neuropathic pain: Aetiology, symptoms, mechanisms, and management. Lancet 1999;353: 1959 – 1964.
3. Staud R, Cannon RC, Mauderli AP, Robinson ME, Price DD, Vierck CJ. Temporal summation of pain from mechanical stimulation of muscle tissue in normal controls and subjects with fibromyalgia syndrome. Pain 2003;102:87 – 95.

4. Banic B, Petersen-Felix S, Andersen OK, Radanov BP, Villiger PM, Arendt-Nielsen L, et al. Evidence for spinal cord hypersensitivity in chronic pain after whiplash injury and in fibromyalgia. Pain 2004;107:7–15.
5. Geenen R, Jacobs JWG. Fibromyalgia: Diagnoses, pathogenesis, and treatment. Current opinion in Anaesthesiology 2001; 14:533–539.
6. Forseth K, Gran JT. Management of fibromyalgia: What are the best treatment choices? Drugs 2002;62:577–592.
7. Wigers SH, Stiles TC, Vogel PA. Effects of aerobic exercise versus stress management treatment in fibromyalgia; a 4.5-year prospective study. Scand J Rheumatol 1996;25: 77–86.
8. Mengshoel AM. Physiotherapy and fibromyalgia: A literature review. Adv Physiother 1999;1:73–82.
9. Ramsay C, Moreland J, Ho M, Joyce S, Walker S, Pullar T. An observer-blinded comparison of supervised and unsupervised aerobic exercise regimens in fibromyalgia. Rheumatology 2000;39:501–505.
10. Busch A, Schachter CL, Peloso PM, Bombardier C. Exercise for treating fibromyalgia syndrome. The Cochrane database of systematic reviews 2002, issue 2. Chichester, UK: Wiley and Sons Ltd; 2005. 35 p.
11. Morley S, Eccleston C, Williams A. Systematic review and meta-analysis of randomized controlled trials of cognitive behaviour therapy and behaviour therapy for chronic pain in adults, excluding headache. Pain 1999;80:1–13.
12. Rossy LA, Buckelew SP, Dorr N, Hagglund KJ, Thayer JF, McIntosh MJ, et al. A meta-analysis of fibromyalgia treatment interventions. Ann Behav Med 1999;21:180–191.
13. Karjalainen K, Malmivaara A, van Tulder M, Roine R, Jauhiainen M, Hurri H, et al. Multidisciplinary biopsychosocial rehabilitation for neck and shoulder pain among working age adults: A systematic review within the framework of the Cochrane Collaboration Back Review Group. Spine 2001; 26:174–181.
14. King SJ, Wessel J, Bhambhani, Y, Sholter D, Maksymowych W. The effects of exercise and education, individually or combined, in women with fibromyalgia. J Rheumatol 2002; 29:2620–2627.
15. Adams N, Sim J. Rehabilitation approaches in fibromyalgia. Disabil Rehabil 2005;27:711–723.
16. Burckhardt CS. Educating patients: Self-management approaches. Disabil Rehabil 2005;17:703–709.
17. Fordyce WE. Behavioral methods for chronic pain and illness. Saint Louis: Mosby; 1976.
18. van Galen A. Geen dag zonder pijn, leven met fibromyalgie, Nationaal instituut voor gezondheidsbevordering en ziektepreventie, Meppel; 1998.
19. Burckhardt CS, Clark SR, Bennett RM. The fibromyalgia impact questionnaire: development and validation. J Rheumatol 1991;18:728–733.
20. Bennet R. The Fibromyalgia Impact Questionnaire (FIQ): A review of its development, current version, operating characteristics and uses. Clin Exp Rheumatol 2005;23(suppl. 39):s154–s162.
21. van der Zee KI, Sanderman R. Handleiding RAND 36. Noordelijk Centrum voor Gezondheidsvraagstukken Rijksuniversiteit Groningen; 1993.
22. Stomp-vanderBerg SGM, ter Kuile MM, Spinhoven P, van Breukelen G, Kole-Snijders AMJ. Pijn Coping en Cognitie Lijst (PCCL) Pijnkenniscentrum AZM; 2001. p 64.
23. Vlaeyen JWS, Kole-Snijders AMJ, Rotteveel AM, Ruesink R, Heuts PHT. The role of fear of movement/(re)injury in pain disability. J Occup Rehab 1995;5:235–252.
24. Roelofs J, Goubert L, Peters ML, Vlaeyen JWS, Crombez G. Tampa scale for kinesiophobia: Further examination of psychometric properties in patients with chronic low back pain and fibromyalgia. Eur J Pain 2004;8:495–502.
25. Hedin PJ, Hamne M, Burckhardt, Engström-Laurent A. The fibromyalgia impact questionnaire, a Swedish translation of a new tool for evaluation of the fibromyalgia patient. Scand J Rheumatol 1995;24:69–75.
26. Epstein SA, Kay G, Clauw D, Heaton R, Klein D, Krupp L. et al. Psychiatric disorders in patients with fibromyalgia. A multicenter investigation. Psychosomatics 1999;40:57–63.
27. Tuzun EH, Albayrak G, Eker L, Sozay S, Daskapan A. A comparison study of quality of life in women with fibromyalgia and myofascial pain syndrome. Disabil Rehabil 2004;26:198–202.
28. Edwards RR, Bingham CO, Bathon J, Haythornthwaite JA. Catastrophizing and pain in arthritis, fibromyalgia, and other rheumatic disease. Arthritis Rheum 2006;55:325–332.
29. Burwinkle T, Robinson JP, Turk DC. Fear of movement: factor structure of the tampa scale of kinesiophobia in patients with fibromyalgia syndrome. J Pain 2005;6;384–391.
30. Vlaeyen JWS, Morley S. Active despite pain: The putative role of stop-rules and current mood. Pain 2004;110:512–516.
31. Ministry of Health. Report on Policy for the Chronically Ill. Den Haag, SDU publishers; 1991.
32. Dutch National Council for Public Health (NRV). Transmurale Somatische Zorg (Somatic Transmural Care). Zoetermeer, NRV; 1995.